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CONSERVATIVE VITAL REACTION
IN PATHOLOGICAL ANATOMY,
PARTICULARLY IN REGARD TO CERTAIN
CHRONIC RHEUMATOID AND GOUTY
CHANGES.

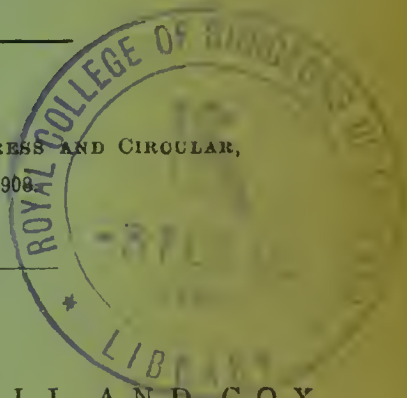
By F. PARKES WEBER, M.D., F.R.C.P.,

Physician to the German Hospital, London, and to the Mount Vernon Hospital
for Chest Diseases, Hampstead.

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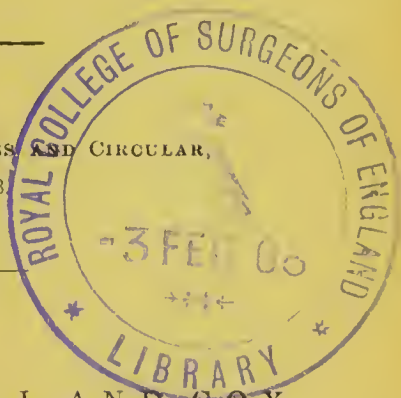


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It is now generally admitted that the limiting fibrosis about old tuberculous lesions in the lungs and elsewhere, is to be regarded as conservative in nature, but it is not quite so obvious that the same explanation applies likewise to the keloid-like scars resulting from tuberculous glandular abscesses in the neck and elsewhere, and to the scar tissue in ordinary fibro-caseous forms of chronic pulmonary tuberculosis. So also, whilst everyone agrees that the fibrosis about old tertiary syphilitic lesions in the liver is evidence of a conservative vital reaction, many will not readily consent to the view that the fibrosis in all cases of hepatic cirrhosis is likewise of essentially the same nature. (a)

In the same way, I believe it is not yet generally admitted that the lipping, synovial overgrowth, and capsular or periarticular fibrous thickening of chronic rheumatoid and gouty joints, and the development of subcutaneous fibrous nodules (with or without tophaceous deposit in them), are essentially manifestations of conservative vital reaction.

In order to make myself clear, I shall first have to explain what I mean by "action" and "vital reaction." The words action, reaction, agent and re-agent are employed in chemistry, physical geography, etc., but in all non-vital processes and phenomena there seems to be very little difference between action and reaction, one reaction serving

(a) The hypertrophic adenoma-like nodules of the hepatic parenchyma in hob-nail livers are of course to be regarded as an attempt at compensatory over-growth, and are therefore likewise the result of a "conservative" reaction.

as, or producing, an agent which provokes another reaction, and so on. Moreover, "vital reactions," which, in the broadest sense of the term, include all those manifestations of irritability which distinguish living from non-living bodies, often (perhaps always) differ from non-vital reactions in being useful (*i.e.*, beneficial for the organism manifesting them), or "conservative" in nature, as if they were purposeful.

In regard to human life and human pathology, I would divide all vital reactions into:—

- (1) Mental or voluntary nervous reactions.
- (2) Reflex or involuntary nervous reactions.
- (3) Vital reactions other than nervous reactions.

Reactions of the third class may manifest themselves (a) by chemical changes, etc., *e.g.*, production of antitoxins, and (b) by anatomical (macroscopic and microscopic) changes. It is only with reactions of this second division of the third class that we are now concerned.

Typical examples of anatomical conservative or compensatory reactions are: (1) the increase of the polymorphonuclear leucocytes in the blood consequent on streptococcal infections, etc.; (2) the increase of the red blood-cells connected with imperfect oxygenation of the blood in chronic cardiac and pulmonary diseases; (3) growth of skeletal muscles consequent on increased functional activity; (4) myocardial hypertrophy in conditions throwing abnormal work on the whole or a portion of the heart musculature; (5) thickening of the skin and subcutaneous tissue from intermittent pressure or friction; (6) hypertrophy of one kidney after removal or disease of the other kidney; (7) the phenomena of the healing of a wound caused by chemical, physical or mechanical agents, with or without infective (microbic) complications. In all such cases, the "agent" (whether chemical, physical, mechanical or "functional") provoking the reaction, and the conservative or compensatory nature of the reaction are obvious, and no difficulties in teleological interpretation can arise.

Difficulties in interpretation, when they arise, are chiefly due to:—

(1) Uncertainty as to the nature of the morbid agent or agents. For instance, in tuberculous affections, before the tubercle bacillus was discovered by Koch as the exciting cause of tuberculosis, the conservative nature of the fibrosis around chronic lesions could of course be but imperfectly guessed at.

(2) Multiplicity of the agents. For instance, in the case of wounds, the reactive processes necessary for aseptic healing were formerly generally associated with the processes due to the infection of the wound with pathogenic microbes, and before the nature of septic inflammation was thoroughly recognised, the phenomena of healing were necessarily confused with those of reaction towards septic infection.

(3) Confusion between the phenomena of the action with those of the reaction. (a) For instance, in chronic tuberculosis, the process of cell-necrosis due to the agent (*i.e.*, to the local presence of the tubercle bacillus) proceeds side by side in the infected animal with reactive attempts at local repair and limitation.

(4) Differences in reaction due to differences of "soil." In human beings, as doubtless in other animals, there are differences in reaction due to individual peculiarity ("idiosyncrasy"), race, sex, age, previous habits, and general nutrition. Children offer a "virgin soil" for the growth of pathogenic microbes. They are infected easily, and the struggle between the morbid agent (the invading microbes) and the infected organism is acute, but usually relatively short. In elderly persons the tissues have, from previous practice, acquired the power of at once resisting many infections, or of yield-

(a) Cf. F. P. Weber, "A Note on Action and Reaction in Pathology and Therapeutics," "St. Bart's. Hospital Reports," vol. 39 p 139.

ing less suddenly than the tissues of young persons to certain diseases, such as tuberculosis. It is especially in chronic tuberculosis in adults, where the battle has been very slow and prolonged, that the anatomical results of morbid action are most intimately mingled with the conservative changes due to reaction.

I will now return to the question of the subcutaneous fibrous nodules occasionally met with in rheumatoid conditions in adults. These differ from the well-known "rheumatic" nodules met with in children suffering from true articular rheumatism, chorea, or rheumatic endocarditis. They are sometimes larger and disappear less readily. The "rheumatic nodules" of children, at least the central portions of the nodules, seem to consist of a more fluid, less organised exudate (*a*), and can, therefore, be more readily absorbed. These differences may, however, be due to differences in reaction towards irritation, that is to say, whatever the nature of the local irritation may be (microbes of rheumatism, necrotic foci, etc.), and irrespective of the question whether there are one or several different causes for the irritation, the tissues of adults may react in a more persistent and "fibrous" manner than those of children. The local reaction resulting in the development of the subcutaneous nodules might in both instances be supposed to be "conservative" in nature, that in adults, however, more nearly resembling the local "fibrous" reaction so often seen about chronic tuberculous foci. One might further suppose that many gouty tophaceous nodules are really of the same nature, the only difference being that, owing to some peculiar local or general chemical state, more or less uratic deposit has occurred into the devitalised tissue of the nodule.

It seems to me also that the lippling, synovial overgrowth, and capsular or periarticular fibrous thickening met with in chronic rheumatoid and gouty joints are to be explained in essentially the same way, that is to say, as representing a chronic vital reaction (of a "conservative" nature) towards

(*a*) See F. J. Poynton and G. F. Still, "The Histology of the Rheumatic Nodule," "Transactions of the Pathological Society," London, 1899, vol. 50, p. 324.

various more or less unknown sources of local irritation. Amongst the local sources of irritation (probably chiefly microbic or toxæmic), I should certainly include the wearing away of articular cartilages owing to devitalisation from old age (in senile osteo-arthritis) and debilitating illnesses, or owing to relatively excessive use. I would consider wear of the articular surfaces as a "source of local irritation" whenever, by reason of devitalisation or excessive function, it exceeds repair. No doubt, however, the disorderly overgrowth sometimes met with is due to nervous influences, and is analogous to the new-bone-formation which sometimes occurs about and in the neighbourhood of joints in cases of spinal arthropathies (*i.e.*, in tabes and syringomyelia).

